

We claim:

1. A process for preparing polyisocyanates by reacting organic
5 amines with phosgene, wherein the reaction is carried out in
at least three stages, with the first stage being carried out
in a mixing apparatus, the second stage in at least one
residence apparatus and the third stage in at least one
10 separation apparatus and the pressure in each successive
stage being lower than that in the previous stage.
2. A process as claimed in claim 1, wherein the polyisocyanate
is diphenylmethane diisocyanate (MDI),
polyphenylene-polymethylene polyisocyanate (PMDI) or a
15 mixture of these two, tolylene diisocyanate (TDI),
hexamethylene diisocyanate (HDI) or isophorone diisocyanate
(IPDI).
3. A process as claimed in claim 1, wherein a nozzle is used as
20 apparatus for the first stage.
4. A process as claimed in claim 1, wherein a tube reactor, a
stirred vessel, an unstirred residence apparatus or a phase
separation apparatus for gas and liquid phases is used as
25 apparatus for the second stage.
5. A process as claimed in any of claims 1-4, wherein the
residence time in the residence apparatus of the second stage
is from 1 second to 30 minutes, preferably from 30 seconds to
30 10 minutes, particularly preferably from 2 to 7 minutes.
6. A process as claimed in any of claims 1-5, wherein the
residence reactor of the second stage is configured as two or
more reactors of the same or different types which are
35 connected in parallel or in series.
7. A process as claimed in claim 1, wherein one or more
(reaction) columns are used as apparatus for the third stage.
- 40 8. A process as claimed in claim 1, wherein the phosgene is
separated off in the apparatus of the third stage, preferably
a (reaction) column.
9. A process as claimed in claim 1, wherein the pressure is
45 reduced from the pressure of the reactor of the first stage
to the pressure of the reactor of the second stage by means

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of a regulating valve or some other device characterized by a pressure drop.

10. A process as claimed in claim 1, wherein the pressure is
5 reduced from the pressure of the reactor of the second stage to the pressure of the reactor of the third stage by means of a regulating valve or some other device characterized by a pressure drop.
- 10 11. A process as claimed in claim 1, wherein the reactor of the first stage is integrated into the reactor of the second stage.
12. A process as claimed in any of claims 1 to 10, wherein the
15 pressure upstream of the static mixer is 3-70 bar, preferably 15-45 bar, the pressure in the reactor of the second stage is 2.5-35 bar, preferably 15-35 bar, and the pressure in the reactor of the third stage is 2-20 bar, preferably 3.5-16 bar.
- 20 13. A process as claimed in any of claims 1 to 11, wherein the temperature in the first, second and third stages is in each case 80-190°C, preferably 90-150°C.
- 25 14. A process as claimed in any of claims 1 to 12, wherein an aromatic hydrocarbon such as toluene or preferably a chlorinated aromatic hydrocarbon such as chlorobenzene, ortho-dichlorobenzene or trichlorobenzene or a mixture thereof is used as inert solvent.

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